Available online at www.sciencedirect.com

ScienceDirect

Energy Procedia 97 (2016) 531 – 538

Energy Procedia

European Geosciences Union General Assembly 2016, EGU
Division Energy, Resources & Environment, ERE

Study of Moroccan Monumental Heritage Traditional for Valorization and Conservation of Collective Memory and for Socio-Eco- Tourism Sustainable Development-case Kasbah Chellah, Rabat

Siham Belhaj, Lahcen Bahi, Ahmed Akhssas*

Mohammed V University,Mohammadia School of Engineers (L3GIE)s ,Rabat,Morocco

Abstract

Like any historical monument flap and around the world, the archaeological site of Chellah named world heritage known chemical and physical degradation due to known natural agents: rainwater, runoff, temperature, humidity, ground movement, bacteria and air pollution. To remedy these degradations several actions were taken by the authorities concerned, but these actions were traditional, superficial and temporary and therefore they brought little lasting remedy to such degradation. To do this, we will try in the present work to analyze these factors degrading to better design the inventory of the monument Chellah.

© 2016 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
Peer-review under responsibility of the organizing committee of the General Assembly of the European Geosciences Union (EGU)

Keywords: EGU; European Geosciences Union; rehabilitation; Chellah; Marinid; adobe; constructions; monument; heritage

1. Introduction

Since immemorial time, and to ensure its survival, the man was trying to feed, to clothe and to shelter, seen these necessities he was forced to develop multi-practices and traditional technics for transport, cultural, fishing, hunting

* Corresponding author. Tel.: +21-266-161-1395;
E-mail address: siham.ellayl.belhaj@gmail.com

1876-6102 © 2016 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
Peer-review under responsibility of the organizing committee of the General Assembly of the European Geosciences Union (EGU)
doi:10.1016/j.egypro.2016.10.068

and housing while remaining in harmony with what gave him the nature. In fact the technics, practices and modern inventions are only the continuation of what was once, and that's why he sees imperative to revive this heritage and treasure, or at least keep it against the effects of time that alienates, corrupts, distorts, damages, uses, and transforms everything that they affect.

In the present work that pours in this direction, we will first show the heritage value of the site in question "Kasbah Chellah" then we will highlight the different types of damages that occur on the site and finally we try to show the importance of the conservation and rehabilitation of the Kasbah.

2. Location of Chellah site

Chellah site or Kasbah the Chellah is an historical monument located in the city of Rabat, the capital of Morocco country that lies north of the African continent, exactly in the province of Rabat -Sale-zemmour –zaer. It is located on the Bouregreg Valley which empties into the Atlantic Ocean, approximately 200 m from the Almohad ramparts, 2 km from the city center, and 4 km from the Atlantic coast [1].

3. Heritage value of the historic site of Chellah

3.1 Prehistoric and historic period

The historical origin dates of Sala's (Chellah' currently) back to VII-VI B.C. During the Phoenician era this site would likely have played the role of seaport on the Atlantic route between Lixus and Mogador. In the Mauritanian era Sala appears as a Prosperous city and opened to the Mediterranean trade. Under the kings Juba II (25 BC 23 AD) and his son Ptolemy (AD 23-40), Chellah has many publics buildings with a Hellenistic and Roman influence, Chellah as well acquires its autonomy and even issued money coins to his name.

After the Roman annexation of Mauritania Tangitane in 40 AD, the city has undergone from the end of I.e. and the early second century a new development plan. While some Mauritanian buildings are preserved others disappeared and publics buildings having an difference orientation from the previous ones were built as The official Capitol, Temple, forum or public square, the basilica, the curia, meeting room of the Senate of the city, the orthogonal Nymphaeum under Emperor Antonius the city were surrounded by 144 of an enclosure mentioned in the inscription Marcus Sulpicius Felix.

The city remained under Roman rule until the late fourth or early fifth century at least, while southern Tangitane was abandoned around 285 AD by the Roman army and administration.

The importance of the city is due both at its location as active port on the Atlantic coast and its strategic role in relation to the rest of the province. Indeed to protect the city from the incursions of the tribe of Autololes and elephants' attacks which are respectively on Pliny the Elder and the decree of surloicius Felix, a defensive system composed of a moat and a wall has been set up.

It stretched from the Atlantic coast to the river Akrach and was connected to the watchtowers and at least two camps. One is located on the southwest of Chellah, the other Kheddis located in the Oulja of Sala [2].

3.2 Marinid period

If one believes the descriptions given by Arab authors, the city seems to have been abandoned since antiquity. In the tenth century. Chellah became a vast Rebate where the faithful gather to fight against heretical tribe Barghawata.

On thirteenth-fourteenth century, the city was reborn: Marinid raised on it a dynastic necropolis.

Before being buried there, the sultan Abu Yusuf Yacoub (1258-1286) built there in 1284 a mosque and a funeral cupola, where was buried his wife Umm al-Izz.

The Sultan Abu Al-Hassan (1331-1351) expanded the necropolis and protected it in 1339 by a large enclosure.

His son Abou Inan (1348-1358) completed the plan by building a madrasa, a Hammam and a hotel and erected ornate cupolas on the graves of his ancestors.

But when they decided to found the necropolis of al-Qulla in Fez, the Marinid condemned the Chellah.

The site was abandoned and its "treasures" were looted in the early fifteenth century, leaving only memories of a multiple holiness millennium "in the margins" of the town of Rebate al Fath.

4. Description of the existing buildings on Chellah site's

4.1 The antique site

Its boundaries remain uncertain; we have identified an area of 4 hectares from 23 hectares.

The main public monuments of the antique district are: the capitol, spas, nymphaeum, basilica, the triumphal arch, pre-roman edifice, the forum.

4.2 The Capitol

In the northwest of the monumental area rises capitol official temple of the Capitoline Triad: Jupiter, Juno and Minerva. Released between 1961 and1969, the building is built on two terraces, superimposed above the area of the triumphal arch; it fits on a long rectangle of 46 m wide and 26 m, an area of 1196 m2 it rank among the temples of the great Roman cities as we can see in the Fig.1.

Fig. 1. Capitol east views'

4.3 The forum

Decumanus maximus is closed at its eastern end by the forum are placed the basics of honorific inscriptions dedicated to emperors and great magistrates of the city. Trapezoidal, it is covered with large slabs blue limestone preserved to 20.60 m the podium. Built upon the work done during the reign of Emperor Trajan, the public square was closed by two monumental gates, which still remain powerful foundations. On the lower level, six shops, served by a secondary route, supported the upper floor.

This limited in the west by a portico extends to 2m below the Mauritanian temple, where were discovered the royal statues, and which was reached by two side stairs (Boube 1966: 28) [3].

4.4 Basilica

The basilica in Fig.2 is based on pre-Roman monuments of different orientation, and above the nymphaeum, with a beautiful architecture. Preserved facade decorated with engaged columns in gray limestone.

Fig. 2. The basilica.

4.5 The Nymphaeum

It is an octagonal building, with niches that were probably harboring statues of nymphs. The building, cutting a primitive castle is actually another water tower fed by an aqueduct. It is, next to another water tank adjacent to the west side and fountains bordering the South side, a true hydraulic complex.

4.6 Islamic site

The necropolis Marinid is built on the ruins of the ancient city of Sala in the late thirteenth century. It was fortified by two enclosures. Inside, three distinct but complementary complexes testify to the richness and greatness of the Marinid building art: the pentagonal enclosure, steam room and khalwa, a term used by residents for saying dynastic necropolis.

4.7 The enclosure pentagonal

A primitive core of the necropolis was founded in 685 H / 1285 by Sultan Marinid Abu Youssef Ya'aqoub (1258-1286). Sultan Abou El Hassan (1331-1351) expanded the necropolis and surrounds in 739 H / 1339 of a second enclosure. Pentagonal, this enclosure, walled oblong towers, follows the topography of the site [4]. It circumscribes an area of 7 hectares and surrounds the primary core. The wall built of adobe is high 6 to 7m and 1.60m thick. Above, a short walkway that protects parapet barricades pyramid of 0.65m. Quadrangular towers, wide and 5m deep of 3.50 m to 3.90 in reinforcing the curtain and give it a military look, Fig. 3, that recalls the contemporary fortifications of Taza or Mansuriyya of Tlemcen (Algeria).

Fig. 3. Chellah's exterior wall and towers

4.8 The funeral complex or Khalwa

The Khalwa occupies the lower part of the site. A large rectangular enclosure of 54m and 35m deep and pierced with two doors, one on the southwest side and one on the northwest side, a circumscribed funeral complex Fig. 4 consists of an oratory, funeral and cupolas a Madrasa [5].

Fig. 4. Abu Hassan's Mausoleum

5. Causes and effects of degradation constructions

5.1 Climate Causes

Analyzing the Fig. 5 of temperature, rainfall we draw:

- The average temperature in the city of Rabat is 16.4 ° C.
- The average rainfall is 550 mm / year with 30% variation from one year to another.

- The wettest period in winter with moist air sea breezes in summer.
- The relative humidity decreases from 80% in the coastal strip about 10% internally.
- The prevailing wind is the gharbi, whose dominant orientation is the West with variations (N / A, N / A), its influence is often reinforced even confused with the sea breeze. The cool, moist winds from west sector are the dominant regime with an average speed of 3 m / s.

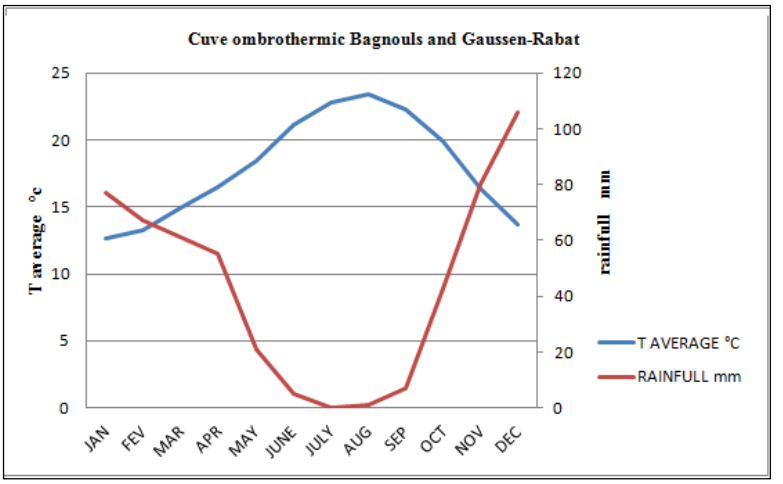

Fig. 5. curve ombrothermic Bagnouls;

So the sub-humid climate of the city of Rabat, which is characterized by high humidity rich ocean salts, is the first physical degradation factor of the monument via the disolution building materials illustrated in Fig. 6, and consequently decreasing their internal cohesion and water rain favors the biological activity and the development of vegetation around the monuments, it deteriorates building materials and aesthetics.

Fig. 6. Dissolution material, lichens and effects of micro organisms

5.2 Dynamic causes

Rabat is located in the southeastern part of Rif furrow is distorted but broadly stable seismic activity remains low but it shall prevent that Rabat has undergone in more time chocks (1915, 1956, 1969, 1979, 2001), So let us not forget the infrastructure development neglecting instability Chellah monument reveals cracks on the facades and causes of falls blocks and parts of the monument Chellah as we can see in Fig. 7.

Fig. 7. Fall blocks

5.3 Organic causes

On the north exhibition facades grow lichens Fig. 6 this last is causing physical and chemical damage because of their metabolic activity (production of oxalic acid) and an aesthetic inconvenience.

The case of the north facade of the wall of Chellah is very demonstrative.

6. Local development

The Chellah site is a common destination for local and foreign tourists from all social classes and all ages and gender. It can help improve the city as it will enhance:

- The cultural tourism embodied by a rich architectural and archaeological heritage and varied
- Beach tourism illustrated by the presence of beaches in and near the metropolis.
- The business and congress tourism, incurred to the position of capital of Rabat.

Chellah in its degraded state is back 11520 euro per year with an average of 40 visitors per day, so that his rehabilitation ultimate proving this amount will increase to 2 points did improve local and foreign tourism system as we can deduct from the Fig. 8.

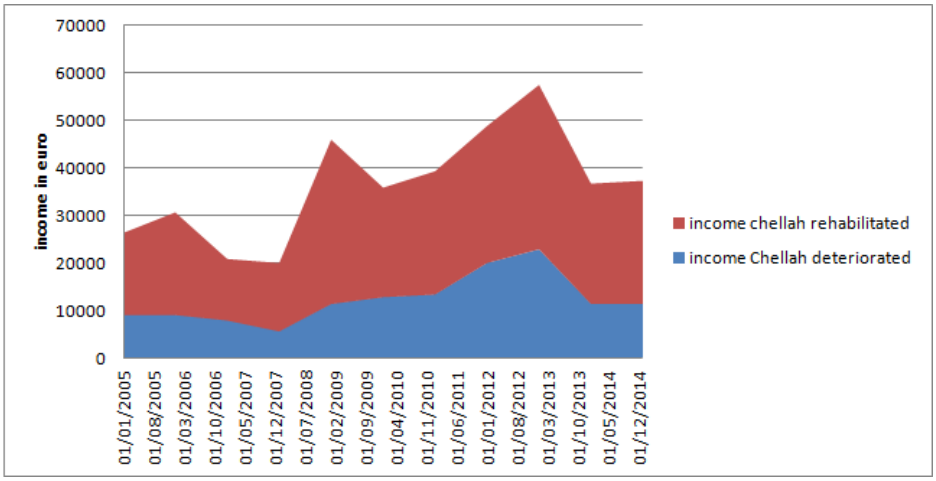

Fig. 8. Comparison Chellah's incoming.

7. Conclusion

The historic monument Chellah with all its heritage is experiencing intense and continuous deterioration in time to remedy the loss of this collective treasure several studies have been done and several actions and decisions were made, but since these interventions remained superficial, the monument could not resist the various players to degradation and aggression that were mentioned in the screen.

Thereby, leading us to certify the main degradation of inherited wealth lies in its use and not in action outside the normal course of the story.

References

[1] UNESCO ; http://whc.unesco.org/fr/documents/117197/
[2] Henri B, Levi Provencal E. Chellah Necropolis Marinid. Edition: Emile Larose-Paris. 1929
[3] Piquet V. History of monuments Islamic on Maghreb; 1937. p. 40-63
[4] Ibn khaldoun. The preliminaries Tome 2, 1863. p. 321-372.
[5] Paccard A. Morocco and traditional Islamic art in architecture.1981